Acoustic Impacts on Marine Life

In the past decade a dismaying sequence of marine mammal strandings has occurred in Greece (1996), the Bahamas (2000), Madeira (2000), Vieques (1998, 2002), the Canary Islands (2002, 2004), the northwest coast of the U.S. (2003) and Hawaii (2004). Each stranding has been correlated with the use of high intensity military sonar. These sonars – both low -frequency (LFAS) and mid -frequency can have a source level of 240 db, which is one trillion times louder than the sounds whales have been shown to avoid. One scientist analyzing underwater acoustic data reported that a single low frequency sonar signal deployed off the coast of California could be heard over the entire North Pacific Ocean.

Necropsies performed on whales stranded in the Bahamas (2000) and the Canary Islands (2002) revealed hemorrhaging around the brain and in other organs most likely due to acoustic trauma from the use of high intensity sonar. It appears that the sonar exercise in the Bahamas in 2000 may have decimated the entire population of beaked whales in the area. In December 2004, 169 whales and dolphins died on beaches in Australia and New Zealand after reported military exercises and air gun use in the area.

In January, 2005, 37 whales stranded on the U.S. coast of North Carolina after high intensity sonar was used in a naval exercise. In March, 2005 almost 80 dolphins stranded on the U.S. coast in Florida after the acknowledged use of naval sonar. Though still too recent to link definitively to sonar, these last three strandings have triggered official inquiries into the possible role played by sonar in these mortalities.

Intense noise generated by commercial air guns used for oil and gas exploration and oceanographic experiments; underwater explosives; and shipping traffic also poses a threat to marine life. Air gun use was correlated with whale strandings in the Gulf of California and Brazil in 2002. The global magnitude of the problem has not even been determined, as many fatally injured animals are likely to sink in the deep ocean and not all injured whales strand.

Thus, a growing body of evidence confirms that intense sound produced by human-generated noise in the marine environment can induce a range of adverse effects on marine mammals. These effects include death and serious injury caused by hemorrhages or other tissue trauma, strandings, temporary and permanent hearing loss or impairment, displacement from preferred habitat and disruption of feeding, breeding, nursing, communication, sensing and other behaviors vital to survival.

High intensity sonars and air guns impact not only marine mammals but also have been shown to affect fish, giant squid and snow crabs. In a study by the British Defense Research Agency, exposure to sonar signals caused auditory damage, internal injuries, eye hemorrhaging and mortality in commercially caught fish. Air guns caused extensive damage to the inner ears of fish and lowered trawl catch rates 45 to 70% over a 2,000 square mile area of ocean (Norwegian Institute of Marine Research). Catch rates did not recover in the five days surveyed after air gun use stopped.

This presents the possibility that increasing production of intense underwater noise can significantly and adversely impact food supply, employment and the economies of maritime countries.

Recent studies show that ocean background noise levels have doubled every decade for the past six decades. As a result of the masking effects of human-produced ocean noise pollution, the possible communication range of blue whales has decreased from greater than 1,000 km to only 100 km in the noisy Northern Hemisphere. We don't know how this affects their ability to find food and mates. Thus, there are numerous indications that intense noise from sonars, air guns, shipping and other sources poses serious threats to cetaceans and the already depleted fish stocks in the world's oceans.

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